



DEPT. OF TRANSPORTATION
DOCKETS

2008 DEC -7 A 11:15

First Technology Safety Systems Inc.
47460 Galleon Drive
Plymouth
MI 48170, USA

Tel: 734 451 7878
Fax: 734 451 9549
Email: sales@ftss.com
Website: www.ftss.com

Nicole R. Nason, Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington DC 20590

Dear Ms Nason,

Subject: Final Rule, Response to Petitions for Reconsideration, Technical Amendment,
Docket No. 2008-0111, Anthropomorphic Test Devices; ES-2re Side Impact
Crash Test Dummy 50th Percentile Adult Male.

First Technology Safety Systems (FTSS) has reviewed the February, 2008, ES-2re dummy drawing package (identified in the above mentioned technical amendment) and we have identified a number of drawing errors and a number of drawing issues. We seek to petition NHTSA to correct these drawings to ensure that the ES-2re dummy continues to meet the same dimensional and performance requirements established for the dummy when the dummy was proposed for inclusion into 49 CFR Part 572 Subpart U. FTSS makes the following comments and recommendations with respect to the drawing package. A marked up drawing for each of these recommended changes are attached to the end of this letter.

- 1) Drawing 175-1011, Top Plate UNLC Blank. Fix typographical errors for dimensions, MØ5.0, MØ6.0, MØ6, and MØ2.5. Eliminate the Ø symbol.
- 2) Drawing 175-3502, Pivot Stop Plate, Left. Fix typographical error on Note #4. Replace RH with LH since this is a left hand part.
- 3) 175-6006, Pubic Symphysis Structural Replacement. There is a Part Mark located at the center of the part. This Part Mark is not defined. FTSS recommends that the Part Mark be clarified or removed altogether from the drawing.
- 4) Drawing 175-6012, Hip Pivot Pin. FTSS believes that dimension "16.994 +0.000 / - 0.011" is a typographical error and should be dimensioned as "16.990 +0.000 / -0.011". The Hip Pivot Pin mates to part number 5000110 (Ball Bearing) – which has an ID dimension of 17.000 +0.000 / -0.008 (vendor specification). The bearing at a nominal dimension of 16.992 would not allow a Hip Pivot Pin at its maximum diameter of 16.994 to fit within the bearing.
- 5) Drawing 175-6010, Iliac Wing Assembly, Left. Fix typographical error for drawing dimension "17.0556". This dimension should be "17" since it is not reasonable to control and measure this molded part to four decimal places and "17" also matches the same dimension as the Iliac Wing Assembly, Right (NHTSA Drawing 175-6002). FTSS also recommends that the drawing dimension "Ø20.03" be replaced with "Ø20.03 ± 0.10" since this dimension cannot be controlled to a tolerance of ± 0.05. We also recommend the addition of dimension "R0.5" to better define this location for easier machining of this particular section of the part and to prevent breakage due to concentrated stresses.

- 6) Drawing 175-6063, Femur Bearing Plate, Left. Fix typographical errors for drawing dimensions 17.5000 ± 0.0001 " and 48.3000 ± 0.0001 ". The tolerances are too tight to reasonably achieve at four decimal places and would add unnecessary expense when making the part. FTSS recommends that these dimensions should be specified as 17.5 ± 0.5 " and 48.3 ". These recommended dimensions would also match the existing dimensions on the Femur Bearing Plate, Right (NHTSA Drawing 175-6068).
- 7) Drawing 175-6068, Femur Bearing Plate, Right. Fix typographical errors by removing the parenthesis from around dimensions (48.3) " and (17.5 ± 0.5) ". This will maintain consistency between NHTSA Drawings 175-6068 and 175-6063.
- 8) Drawing 175-6002, Iliac Wing Assembly, Right. FTSS recommends that the drawing dimension $\varnothing 20.03$ " be replaced with $\varnothing 20.03 \pm 0.10$ " since this dimension cannot be controlled to ± 0.05 . We also recommend the addition of dimension $R0.5$ " to better define this location for easier machining of this particular section of the part and to prevent breakage due to concentrated stresses.
- 9) Drawing 175-2003, Plate, Neck Head & Torso Interface. FTSS recommends that NHTSA part number 5000049 Helicoil, M6 x 1 x 6, be replaced with part number 5000729 Helicoil M6 x 1 x 4.5 because the 5000049 Helicoil is too long and may not sit below the machined surface due to stack up tolerance of parts. FTSS also suggests the addition of dimension $4X R3.2$ "to the Surface" on Detail Z in order to clarify the dimension.
- 10) Drawing 175-3000, Shoulder Assembly. FTSS recommends that NHTSA part number 5000014 SHCS, M6 x 1 x 35, be replaced with part number 5000008 SHCS, M6 x 1 x 30 because the 5000014 SHCS is too long to properly secure the assembled parts. The M6 x 1 x 35 SHCS is supposed to secure the Shoulder Top Plate (175-3008) to the Shoulder Spacer Block (175-3002). However, the Shoulder Top Plate has a material thickness of 8 mm and the Shoulder Spacer Block has a material thickness of 25.5 mm. Together, the overall thickness of the combined parts is 33.5 mm – which is 1.5 mm shallower than the length of the 35 mm long SHCS. This will create a condition where the 35 mm SHCS will not clamp the parts properly. A M6 x 1 x 30 SHCS will provide a 3.5 mm clearance to the bottom of the threaded holes on the Shoulder Spacer Block and is therefore an appropriate fastener for this application.
- 11) Drawing 175-3011, CAM Buffer Pad. FTSS has noted that the current dimensions for this part have tolerances that are too tight to accurately control a molded part. We recommend that the NHTSA drawing dimensions: $\varnothing 5.0$ ", 90.0 ", 5.0 ", and 21.2 ± 0.2 " be replaced with these dimensions: $\varnothing 5$ ", 90 ", 5 ", 21.2 ± 0.3 ".
- 12) Drawing 175-7058, Friction Plate Retaining Stud. FTSS believes that the Datum A tolerance of $.0003$ " for the perpendicular surfaces is unnecessarily tight at four decimal places. We recommend a tolerance of $.003$ " because the NHTSA tolerance is too tight to be reasonably measured and therefore accurately controlled. Furthermore, at tolerance of $.0003$ " would add unnecessary cost to the part.
- 13) Drawing 175-7085-1, Knee Flesh, Left. There is a note on the drawing that states: $\frac{1}{4}$ " OVER WIDTH "A" FOR 180". But, "A" is not defined on the drawing. However, "A" is defined on the corresponding drawing 175-7085-2, Knee Flesh, Right. FTSS recommends that drawing 175-7085-1 be corrected to add a definition for "A" to match drawing 175-7085-2 – which specifies that $A = 1 - \frac{3}{4}$ ".
- 14) Drawing 175-7090-1, Thigh Molded, Left. Fix typographical errors for drawing dimensions $(2x \varnothing 24)$ " and $(2x \varnothing 14)$ ". These dimensions should be listed as $(2x \varnothing 24)$ " and $(2x 14)$ ". Removal of extra or redundant \varnothing symbol is required. This would also make this part consistent with the Thigh Molded, Right drawing (NHTSA Drawing 175-7090-2).

- 15) Drawing 175-9013, Bearing. The drawing has a reference to Note#2 in the revision record (REV B), but the note is missing from the "NOTES" field. FTSS recommends that the note be added to the note field, or the note reference be eliminated from the revision record.
- 16) Drawing 175-9014, Pin Machined. Correct typographical error for missing revision indicator for REV B on the Material Reference. The revision record states "ADDED REF. TO MATERIAL SPECIFICATION"; however no revision reference bubble was added.
- 17) Drawing 175-9027, Lower Mounting Base. FTSS recommends that the following NHTSA dimensions "92.5 +0 / - 0.2", "66.5 +0 / -0.2", and "4 x 6 x 45" be replaced with "91.4 +0 / -0.2", "66.0 +0 / -0.2", and "4 x 9.7 x 45" respectively. We recommend these changes due to the wider tolerances associated with typical product dimensions specified for the 3" x 4" tubular steel beam that the Lower Mounting Base fits into. These tolerances are typically ± 0.030 for the tubular beam so our recommended dimensional changes for the Lower Mounting Base is necessary to guarantee that the Lower Mounting Base will fit into the wide variety of pendulums beams in the marketplace.
- 18) Drawing SA572-S71-1, Lower Neck Load Cell Assembly. FTSS recommends that specification of the part weight be correct to include the weight of the two connector/cable assemblies. The weight currently specified for this part in the NHTSA drawing is "0.8 lb. / 0.36 kg MAX." However, this weight does not include the weight of the electrical connector/cable assemblies. Since the cables are hard wired to the load cell, they need to be included in the total weight. Therefore, we request that the assembly weight be listed as "0.93 lb. / 0.42 kg MAX" to include the two cable assemblies.

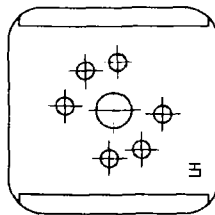
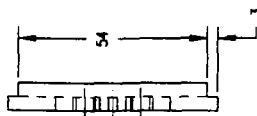
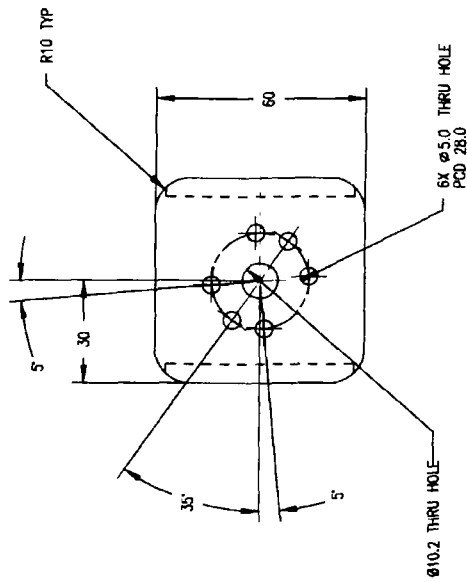
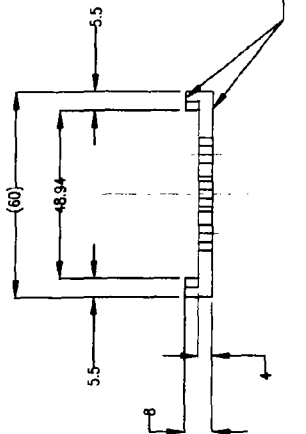
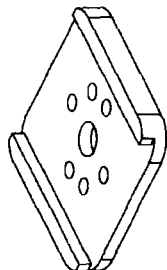
If you have any questions regarding these comments to the Final Rule, Response to Petitions for Reconsideration, Technical Amendment, please contact me at (734) 446-3132 or at jbastian@ftss.com.

Sincerely,



Joseph Bastian
Engineering Manager
First Technology Safety Systems, Inc

cc: Jerry Wang



REPLACED
FEB. 29, 2008
NHISA

NOTES:

1. MACHINED SURFACE FINISH TO BE $\sqrt{0.8}$ OR BETTER.
2. REMOVE ALL BURRS AND SHARP EDGES.
3. SURFACES TO BE FREE FROM SCRATCHES AND INDENTATIONS.
4. MARK "TH" WITH INDELEBIL INK OR EQUIVALENT AS SHOWN.

"TH"

1

2

3

4

REV	DESCRIPTION	DATE	BY
A	NHISA PART 572 NORM RELEASE	7/30/04	DW
B	ADDED REF TO MATERIAL SPECIFICATION, REVISED NOTIF #4	12/28/05	DW

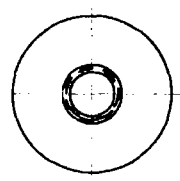
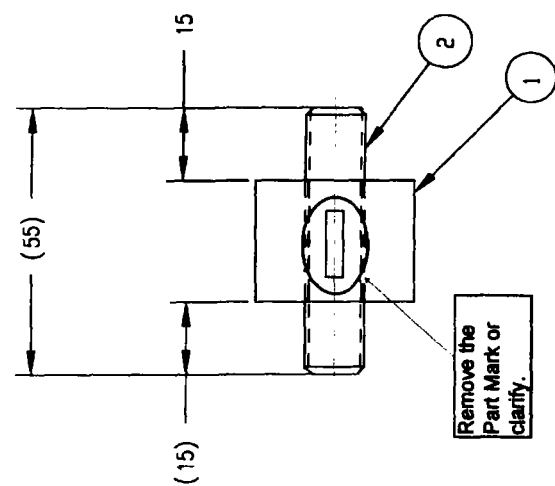
ITEM NO.	QTY	PART NO.	DESCRIPTION
PART LIST			
UNITS ARE millimeters			
POLYCARBONATE			
TOLERANCES ARE:			
DECIMALS	FRACTIONS	ANGLES	MACHINING
± .005	± 1/64	± .01	± .005
± .01	± 1/32	± .02	± .01
± .02	± 1/16	± .03	± .02
± .05	± 1/8	± .05	± .05
* UNLESS OTHERWISE SPECIFIED			
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION			
PIVOT STOP PLATE, LEFT			
A2 1 OF 1 175-3502			

2

3

4


REVISION RECORD			
REV.	DESCRIPTION	DATE	BY
A	NHTSA PART 572 NPMV RE-TEST	1/30/04	DW
B	REMOVED "PART MARK" NOTE #2	12/5/03	DW



RELEASED
FEB. 28, 2008
NHTSA

NOTES:
1. BOND ITEM #1 AND ITEM #2 USING LOCTITE 601 STUD LOCK.

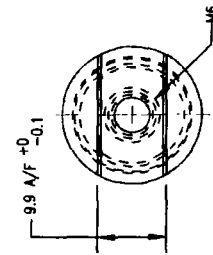
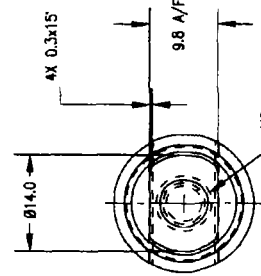
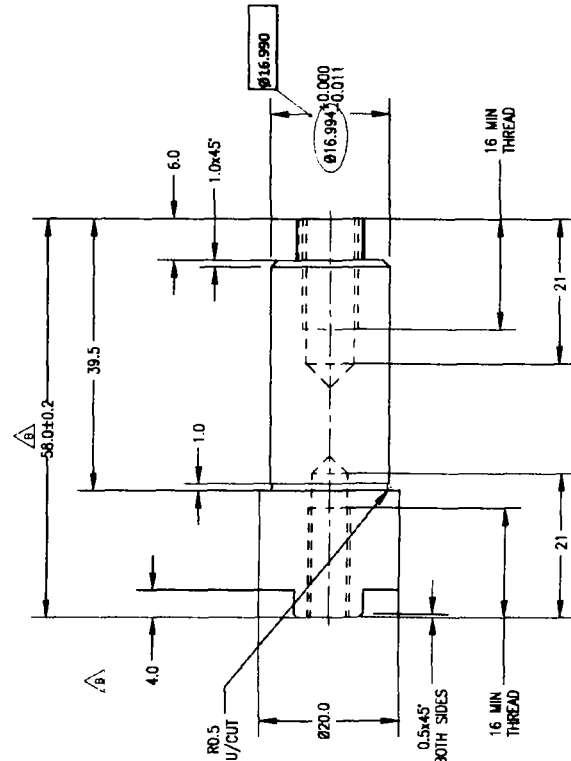
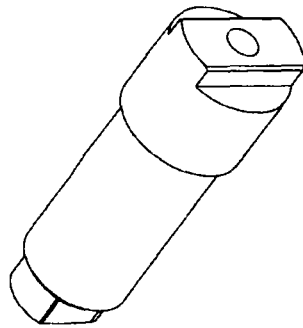
ITEM NO.	QTY	PART NO.	DESCRIPTION
2	1	175-6008	STUD, STRUCTURAL REPLACEMENT
1	1	175-6007	SPACER, STRUCTURAL REPLACEMENT

 NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		PUBIC SYMPLYSIS	
STRUCTURAL REPLACEMENT		175-6006	
1 OF 1		1	

PART LIST			
ITEM NO.	QTY	PART NO.	DESCRIPTION
2	1	175-6008	STUD, STRUCTURAL REPLACEMENT
1	1	175-6007	SPACER, STRUCTURAL REPLACEMENT

UNITS ARE millimeters		1.000	
TOLERANCES ARE:		ANGLES:	
DECIMALS:		±0.5	
ANGLES:		±0.5	
MACHINED:		±0.05	
±0.05		±0.05	

REV.	DESCRIPTION	DATE	BY
A	NHTSA PART 572 NPMV RE-TEST	1/30/04	DW
B	REMOVED "PART MARK" NOTE #2	12/5/03	DW



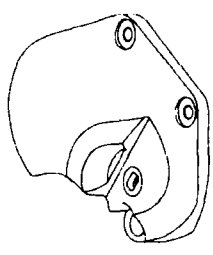
- NOTES:
1. SURFACE FINISH TO BE $\sqrt{0.8}$
 2. REMOVE ALL SHARP EDGES AND BURRS
 3. FINISH REF.: CHEM-BLACK

RELEASED
FEB. 28, 2008
NHTSA

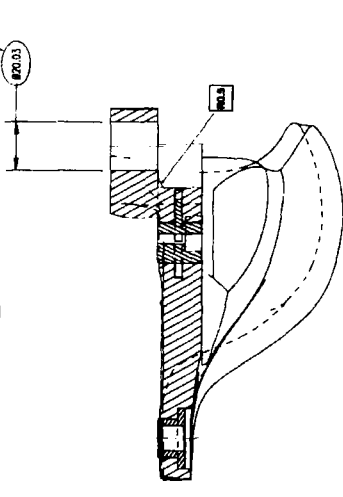
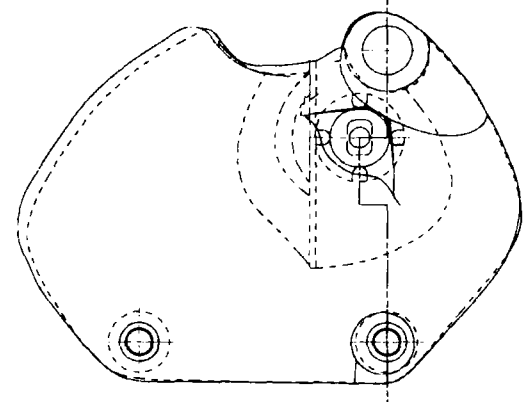
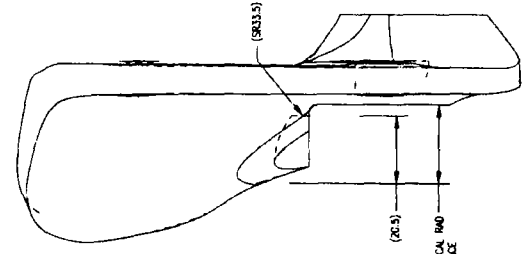
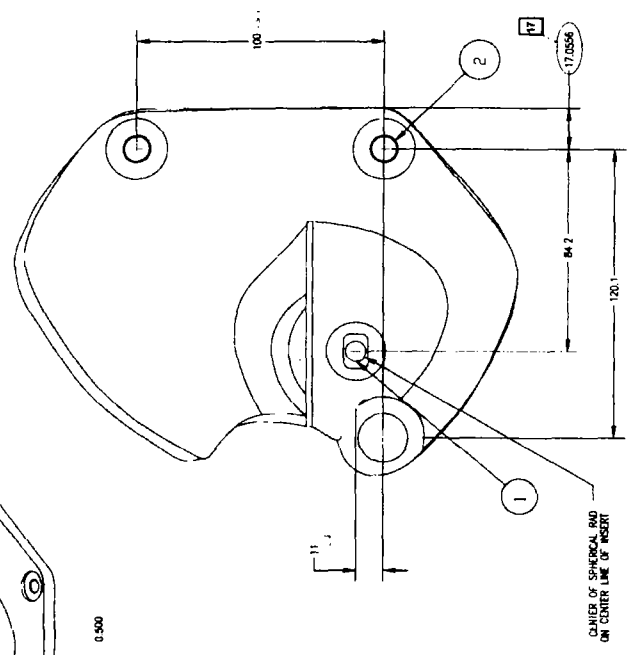
REV	DESCRIPTION	DATE	BY
A	INHLISA PART 5/2 NTRM RELEASE.	1/55/04	DW
B	REMOVED THREADS NOTE #2 & PART MARK NOTE #3. ADDED REF. TO MATERIAL SPECIFICATION & FINISH NOTE #3. CHANGED DIMENSION (58) TO 58.0 ± 0.2 AND REMOVED 14.5 DIMENSION.	12/6/05	DW

PART LIST		DESCRIPTION	
QTY	PART NO.		
UNITS ARE millimeters			
MATERIAL: 000M40 STEEL (EN8)			
TOLERANCES ARE:			
DESCRIPTORS	ANGLES	SALES	WORKED
X .015			
X .011			
X .010			
* SEE DRAWING FOR DETAILS			
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		HIP PIVOT PIN	
12		1 OF 1	
175-6312		B	

REVISION RECORD			
NO.	DATE	BY	REVISION
1	10/1/75	W. J. HARRIS	DESIGN
2	10/1/75	W. J. HARRIS	DESIGN
3	10/1/75	W. J. HARRIS	DESIGN
4	10/1/75	W. J. HARRIS	DESIGN



SCALE 0.500



SECTION A-A

W. J. HARRIS
FEB. 28, 2000
REVISED

REVISION RECORD			
NO.	DATE	BY	REVISION
1	10/1/75	W. J. HARRIS	DESIGN
2	10/1/75	W. J. HARRIS	DESIGN
3	10/1/75	W. J. HARRIS	DESIGN
4	10/1/75	W. J. HARRIS	DESIGN

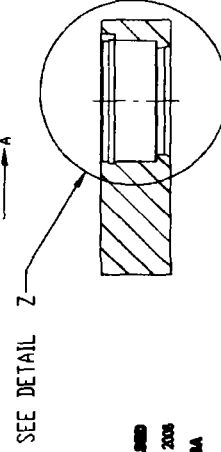
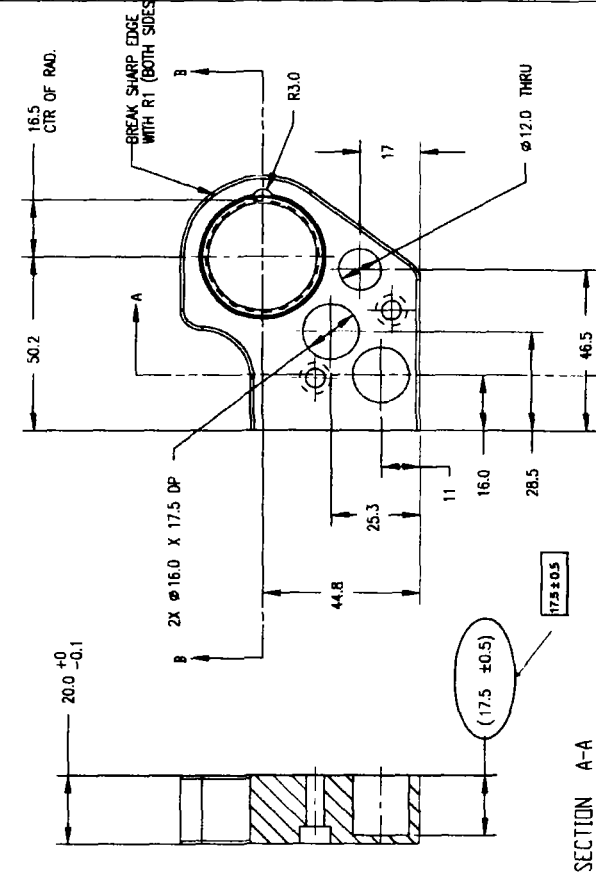
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION			
ILAC WING ASSEMBLY, LEFT			
QTY	PART NO.	DESCRIPTION	PART LEFT
2	175-6003	ILAC WING INSERT (TOP HALF)	
1	175-6004	ILAC WING INSERT	

UNITS ARE MILLIMETERS			
QTY	PART NO.	DESCRIPTION	PART LEFT
2	175-6003	ILAC WING INSERT (TOP HALF)	
1	175-6004	ILAC WING INSERT	

TOLERANCES UNLESS OTHERWISE SPECIFIED			
QTY	PART NO.	DESCRIPTION	PART LEFT
2	175-6003	ILAC WING INSERT (TOP HALF)	
1	175-6004	ILAC WING INSERT	


- NOTES:
1. DEBUR
 2. ALL TOLERANCES OTHER THAN HOLE CENTERS ±1mm.

REVISION RECORD			
REV.	DESCRIPTION	DATE	BY
A	NHISA PART 572 N-PRM RELEASE	1/35/04	UW
B	ADDED REF. TO MATERIAL SPECIFICATION	12/8/05	DW

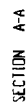


RELEASED
FEB 29, 2006
NHISA

SECTION B-B

REF. NO.	QTY	PART NO.	DESCRIPTION	
			PART LIST	
UNITS ARE millimeters			NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
TOLERANCES ARE *				
FRACTIONS DECIMALS ANGLES			FEMUR BEARING PLATE, RIGHT	
1/16 0.0625 1/16 0.0625 1/16 0.0625				
1/32 0.03125 1/32 0.03125 1/32 0.03125				
1/64 0.015625 1/64 0.015625 1/64 0.015625				
1/128 0.0078125 1/128 0.0078125 1/128 0.0078125				
1/256 0.00390625 1/256 0.00390625 1/256 0.00390625				
1/512 0.001953125 1/512 0.001953125 1/512 0.001953125				
1/1024 0.0009765625 1/1024 0.0009765625 1/1024 0.0009765625				
1/2048 0.00048828125 1/2048 0.00048828125 1/2048 0.00048828125				
1/4096 0.000244140625 1/4096 0.000244140625 1/4096 0.000244140625				
1/8192 0.0001220703125 1/8192 0.0001220703125 1/8192 0.0001220703125				
1/16384 0.00006103515625 1/16384 0.00006103515625 1/16384 0.00006103515625				
1/32768 0.000030517578125 1/32768 0.000030517578125 1/32768 0.000030517578125				
1/65536 0.0000152587890625 1/65536 0.0000152587890625 1/65536 0.0000152587890625				
1/131072 0.00000762939453125 1/131072 0.00000762939453125 1/131072 0.00000762939453125				
1/262144 0.000003814697265625 1/262144 0.000003814697265625 1/262144 0.000003814697265625				
1/524288 0.0000019073486328125 1/524288 0.0000019073486328125 1/524288 0.0000019073486328125				
1/1048576 0.00000095367431640625 1/1048576 0.00000095367431640625 1/1048576 0.00000095367431640625				
1/2097152 0.000000476837158203125 1/2097152 0.000000476837158203125 1/2097152 0.000000476837158203125				
1/4194304 0.0000002384185791015625 1/4194304 0.0000002384185791015625 1/4194304 0.0000002384185791015625				
1/8388608 0.00000011920928955078125 1/8388608 0.00000011920928955078125 1/8388608 0.00000011920928955078125				
1/16777216 0.000000059604644775390625 1/16777216 0.000000059604644775390625 1/16777216 0.000000059604644775390625				
1/33554432 0.0000000298023223876953125 1/33554432 0.0000000298023223876953125 1/33554432 0.0000000298023223876953125				
1/67108864 0.00000001490116119384765625 1/67108864 0.00000001490116119384765625 1/67108864 0.00000001490116119384765625				
1/134217728 0.000000007450580596923828125 1/134217728 0.000000007450580596923828125 1/134217728 0.000000007450580596923828125				
1/268435456 0.0000000037252902984619140625 1/268435456 0.0000000037252902984619140625 1/268435456 0.0000000037252902984619140625				
1/536870912 0.00000000186264514923095703125 1/536870912 0.00000000186264514923095703125 1/536870912 0.00000000186264514923095703125				
1/1073741824 0.000000000931322574615478515625 1/1073741824 0.000000000931322574615478515625 1/1073741824 0.000000000931322574615478515625				
1/2147483648 0.0000000004656612873077392578125 1/2147483648 0.0000000004656612873077392578125 1/2147483648 0.0000000004656612873077392578125				
1/4294967296 0.00000000023283064365386962890625 1/4294967296 0.00000000023283064365386962890625 1/4294967296 0.00000000023283064365386962890625				
1/8589934592 0.000000000116415321826934814453125 1/8589934592 0.000000000116415321826934814453125 1/8589934592 0.000000000116415321826934814453125				
1/17179869184 0.0000000000582076609134674072265625 1/17179869184 0.0000000000582076609134674072265625 1/17179869184 0.0000000000582076609134674072265625				
1/34359738368 0.00000000002910383045673370361328125 1/34359738368 0.00000000002910383045673370361328125 1/34359738368 0.00000000002910383045673370361328125				
1/68719476736 0.000000000014551915228366851806640625 1/68719476736 0.000000000014551915228366851806640625 1/68719476736 0.000000000014551915228366851806640625				
1/137438953472 0.0000000000072759576141834259033203125 1/137438953472 0.0000000000072759576141834259033203125 1/137438953472 0.0000000000072759576141834259033203125				
1/274877906944 0.00000000000363797880709171295166015625 1/274877906944 0.00000000000363797880709171295166015625 1/274877906944 0.00000000000363797880709171295166015625				
1/549755813888 0.000000000001818989403545856475830078125 1/549755813888 0.000000000001818989403545856475830078125 1/549755813888 0.000000000001818989403545856475830078125				
1/1099511627776 0.0000000000009094947017729282379150390625 1/1099511627776 0.0000000000009094947017729282379150390625 1/1099511627776 0.0000000000009094947017729282379150390625				
1/2199023255552 0.00000000000045474735088646411895751953125 1/2199023255552 0.00000000000045474735088646411895751953125 1/2199023255552 0.00000000000045474735088646411895751953125				
1/4398046511104 0.000000000000227373675443232059478759765625 1/4398046511104 0.000000000000227373675443232059478759765625 1/4398046511104 0.000000000000227373675443232059478759765625				
1/8796093022208 0.0000000000001136868377216160297393798828125 1/8796093022208 0.0000000000001136868377216160297393798828125 1/8796093022208 0.0000000000001136868377216160297393798828125				
1/17592186044416 0.00000000000005684341886080801486968994140625 1/17592186044416 0.00000000000005684341886080801486968994140625 1/17592186044416 0.00000000000005684341886080801486968994140625				
1/35184372088832 0.000000000000028421709430404007434844970703125 1/35184372088832 0.000000000000028421709430404007434844970703125 1/35184372088832 0.000000000000028421709430404007434844970703125				
1/70368744177664 0.0000000000000142108547152020037424224853515625 1/70368744177664 0.0000000000000142108547152020037424224853515625 1/70368744177664 0.0000000000000142108547152020037424224853515625				
1/140737488355328 0.00000000000000710542735760100187121124267578125 1/140737488355328 0.00000000000000710542735760100187121124267578125 1/140737488355328 0.00000000000000710542735760100187121124267578125				
1/281474976710656 0.000000000000003552713678800500935605621337890625 1/281474976710656 0.000000000000003552713678800500935605621337890625 1/281474976710656 0.000000000000003552713678800500935605621337890625				
1/562949953421312 0.0000000000000017763568394002504678028106689453125 1/562949953421312 0.0000000000000017763568394002504678028106689453125 1/562949953421312 0.0000000000000017763568394002504678028106689453125				
1/1125899906842624 0.0000000000000008881784197001252339014053344265625 1/1125899906842624 0.0000000000000008881784197001252339014053344265625 1/1125899906842624 0.0000000000000008881784197001252339014053344265625				
1/2251799813685248 0.00000000000000044408920985006261695070266721328125 1/2251799813685248 0.00000000000000044408920985006261695070266721328125 1/2251799813685248 0.00000000000000044408920985006261695070266721328125				
1/4503599627370496 0.00000000000000022204460492503130847535133360640625 1/4503599627370496 0.00000000000000022204460492503130847535133360640625 1/4503599627370496 0.00000000000000022204460492503130847535133360640625				
1/9007199254740992 0.000000000000000111022302462515654237675666803203125 1/9007199254740992 0.000000000000000111022302462515654237675666803203125 1/9007199254740992 0.000000000000000111022302462515654237675666803203125				
1/18014398509481984 0.0000000000000000555111512312578271188378334016015625 1/18014398509481984 0.0000000000000000555111512312578271188378334016015625 1/18014398509481984 0.0000000000000000555111512312578271188378334016015625				
1/36028797018963968 0.00000000000000002775557561562891355941891670080078125 1/36028797018963968 0.00000000000000002775557561562891355941891670080078125 1/36028797018963968 0.00000000000000002775557561562891355941891670080078125				
1/72057594037927936 0.000000000000000013877787807814456779709458350400390625 1/72057594037927936 0.000000000000000013877787807814456779709458350400390625 1/72057594037927936 0.000000000000000013877787807814456779709458350400390625				
1/144115188075855872 0.0000000000000000069388939039072283898547291752001953125 1/144115188075855872 0.0000000000000000069388939039072283898547291752001953125 1/144115188075855872 0.0000000000000000069388939039072283898547291752001953125				
1/288230376151711744 0.00000000000000000346944695195361419492736458760009765625 1/288230376151711744 0.00000000000000000346944695195361419492736458760009765625 1/288230376151711744 0.00000000000000000346944695195361419492736458760009765625				
1/576460752303423488 0.000000000000000001734723475976807097463682293800048828125 1/576460752303423488 0.000000000000000001734723475976807097463682293800048828125 1/576460752303423488 0.000000000000000001734723475976807097463682293800048828125				
1/1152921504606846976 0.0000000000000000008673617379884035487318411469000244140625 1/1152921504606846976 0.0000000000000000008673617379884035487318411469000244140625 1/1152921504606846976 0.0000000000000000008673617379884035487318411469000244140625				
1/2305843009213693952 0.000000000000000000433680868994201774365920573450001220703125 1/2305843009213693952 0.000000000000000000433680868994201774365920573450001220703125 1/2305843009213693952 0.000000000000000000433680868994201774365920573450001220703125				
1/4611686018427387904 0.00000000000000000021684043449710088718296028672500006103515625 1/4611686018427387904 0.00000000000000000021684043449710088718296028672500006103515625 1/4611686018427387904 0.00000000000000000021684043449710088718296028672500006103515625				
1/9223372036854775808 0.0000000000000000001084202172485504435914801433625000030517578125 1/9223372036854775808 0.0000000000000000001084202172485504435914801433625000030517578125 1/9223372036854775808 0.0000000000000000001084202172485504435914801433625000030517578125				

	7	6	5	4	3	2	1
3							

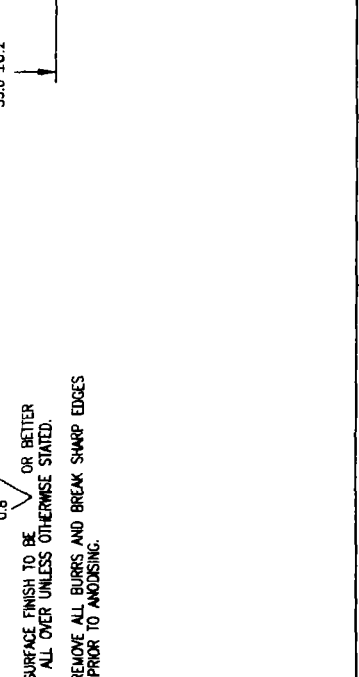
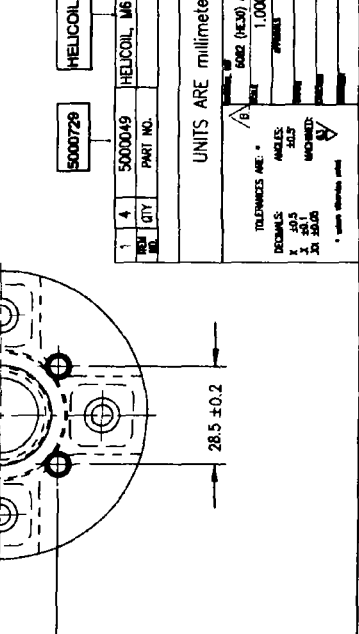
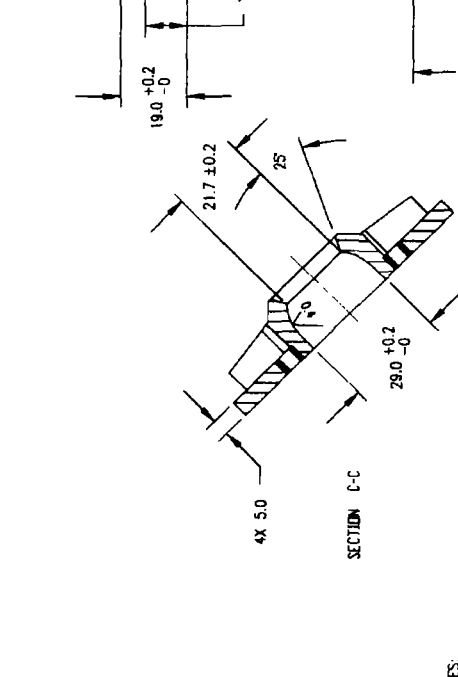
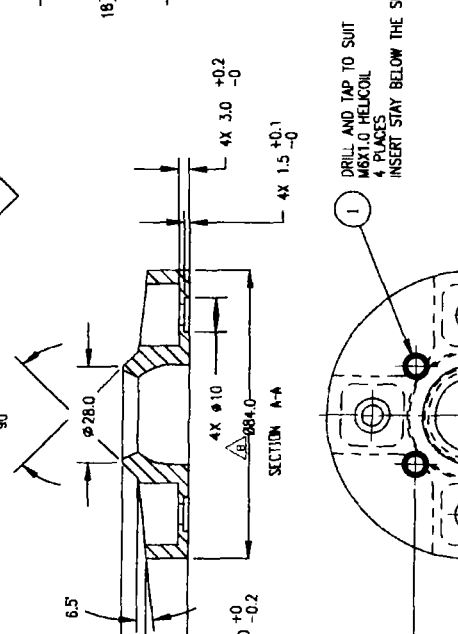
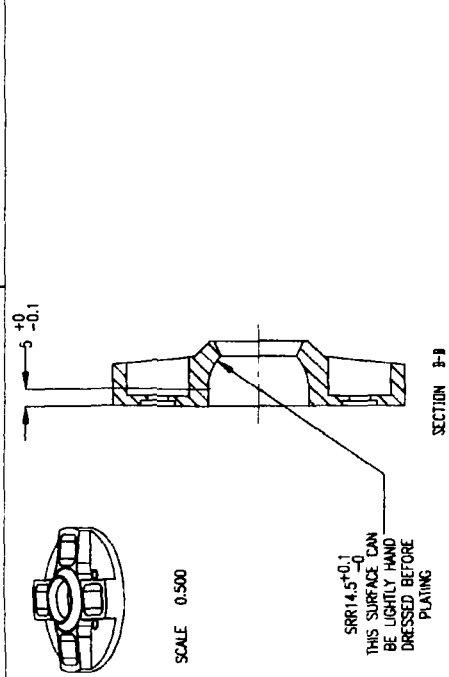
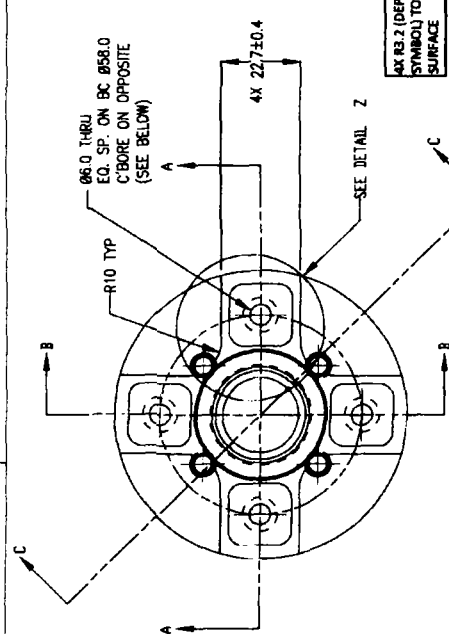


NOTES

1. DEBURR
2. ALL TOLERANCES OTHER THAN HOLE CENTERS $\pm 1mm$

7

REVISION RECORD			
REV	DESCRIPTION	DATE	BY
A	NHTSA PART 572 NHTSA RELEASE	7/30/04	DW
B	CHANGED DIMENSIONS 084.00 TO 084.0 & 06 TO 06.0. ADDED REF. TO MATERIAL SPECIFICATION. REMOVED NOTES 3, 4, 5 & 6.	11/29/05	DW



SCALE 0.500

SRR14.5±0.1
THIS SURFACE CAN
BE LIGHTLY HAND
DRESSED BEFORE
PLATING

NOTES:
1. SURFACE FINISH TO BE 0.8 OR BETTER ALL OVER UNLESS OTHERWISE STATED.
2. REMOVE ALL BURRS AND BREAK SHARP EDGES PRIOR TO ANODISING.

RELEASED
FEB 28, 2008
NHTSA

PART LIST			
ITEM NO.	QTY	PART NO.	DESCRIPTION
1	4	50000049	HELICOIL, M6 X 1 X 6
2	4	5000728	HELICOIL M6 X 1 X 4.5

UNITS ARE millimeters

6000 (HEX) ALUMINUM

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

1.000

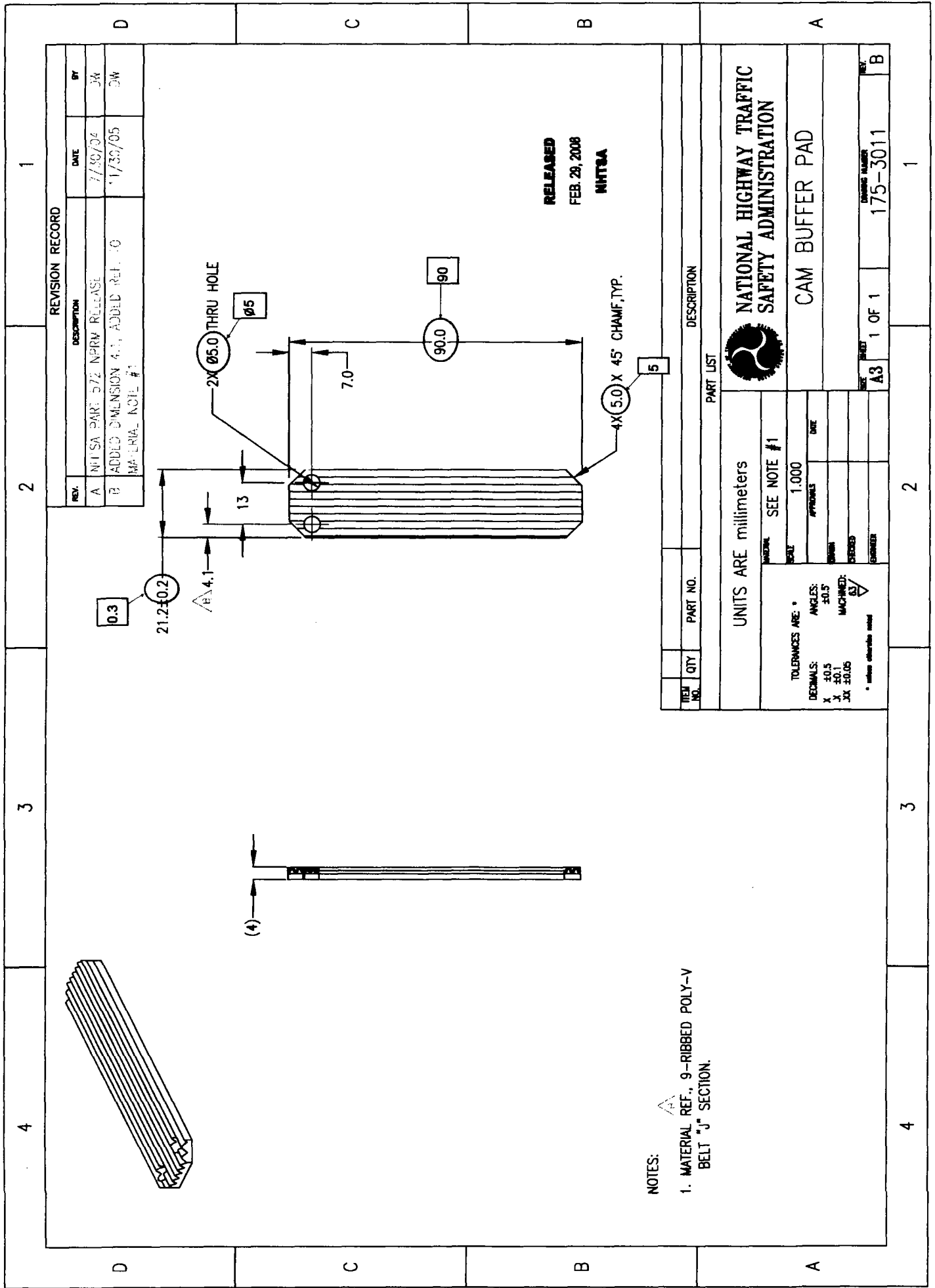
1.000

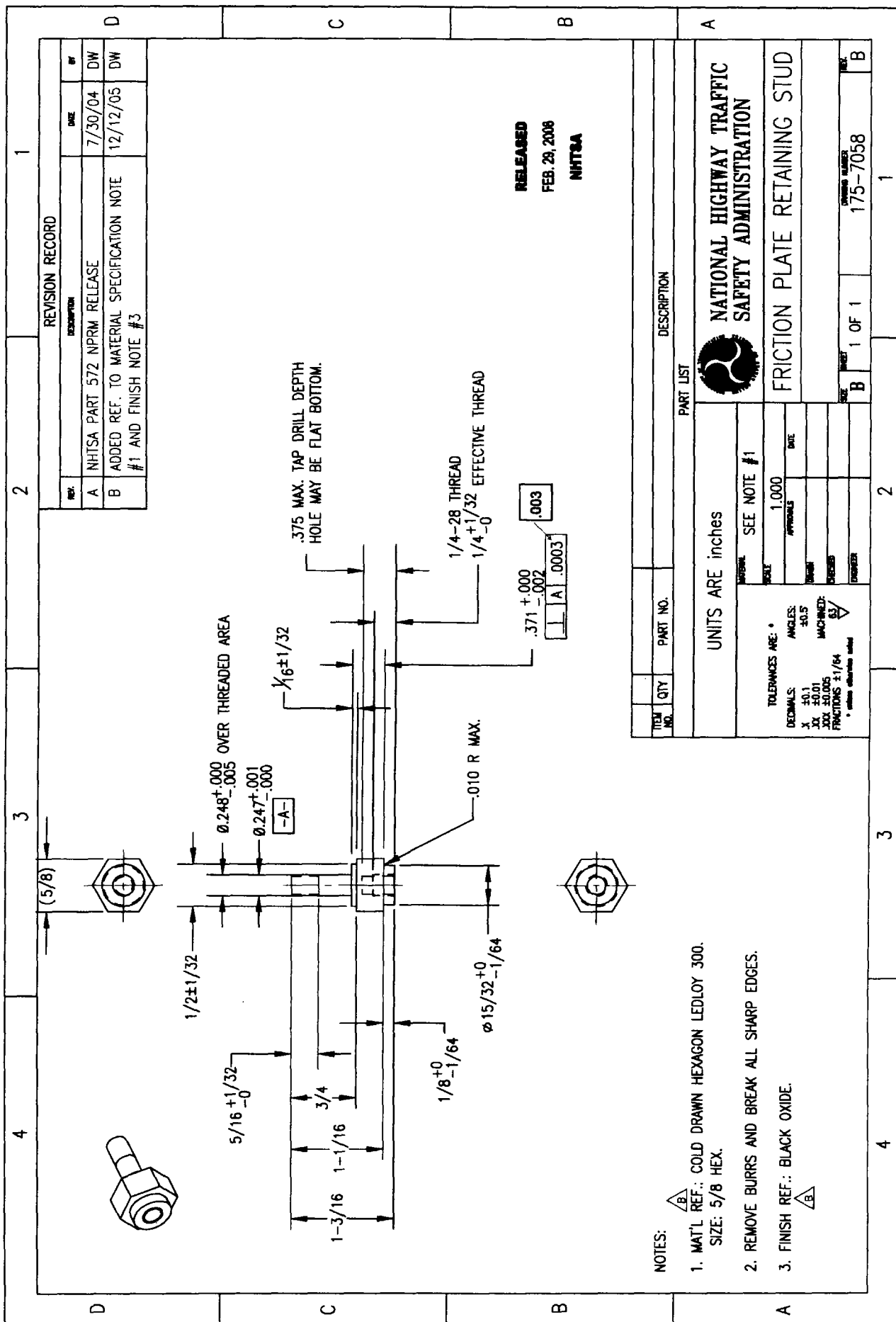
1.000

1.000

1.000

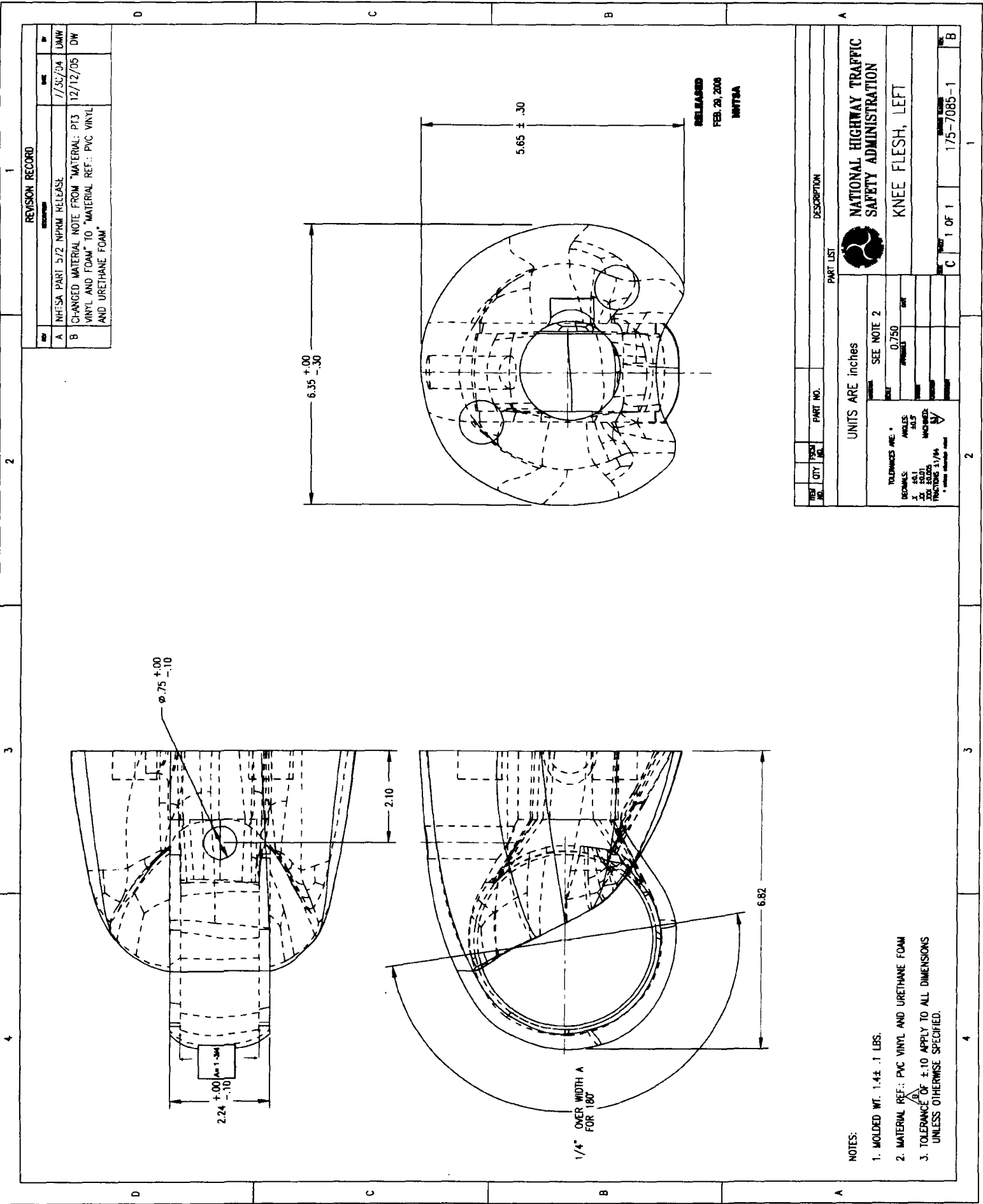
1.000





NOTES:

1. MAT'L REF.: COLD DRAWN HEXAGON LEDLOY 300.
SIZE: 5/8 HEX.
2. REMOVE BURRS AND BREAK ALL SHARP EDGES.
3. FINISH REF.: BLACK OXIDE.



REVISION RECORD			
REV	DESCRIPTION	DATE	BY
A	INTESA PART 5/2 NPHM RELEASE	1/30/04	UMW
B	CHANGED MATERIAL NOTE FROM "MATERIAL: P13 VINYL AND FOAM" TO "MATERIAL REF.: PVC VINYL AND URETHANE FOAM"	12/12/05	DW

RELEASED
FEB. 26, 2008
INTESA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
KNEE FLESH, LEFT	
C	1 OF 1
175-7085-1	

PART LIST	
QTY	DESCRIPTION
1	SEE NOTE 2
0.750	INTESA

UNITS ARE inches	
INCHES	MM
FEET	METERS
YARDS	KILOMETERS
POUNDS	KILOGRAMS
TONS	TONNES
SLUGS	SLUGS
GRAINS	GRAINS
POUNDS PER SQUARE INCH	POUNDS PER SQUARE INCH

1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

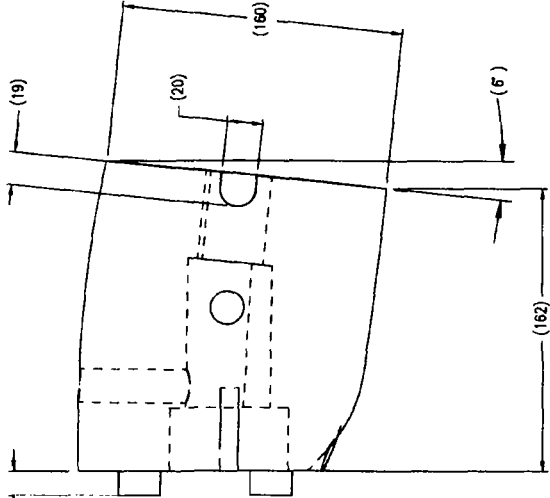
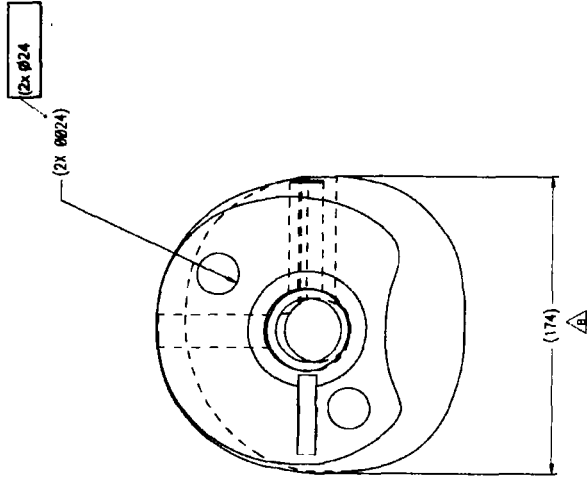
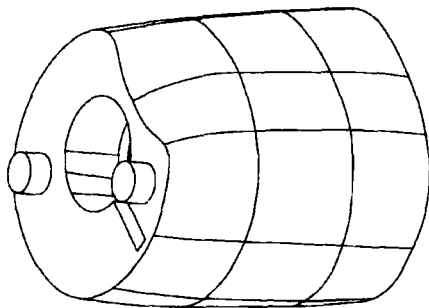
1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

1	2	3	4
---	---	---	---

NOTES:
1. MOLDED WT. 1.4 ± .1 LBS.
2. MATERIAL REF.: PVC VINYL AND URETHANE FOAM
3. TOLERANCE OF ±.10 APPLY TO ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED.



NOTES:

1. MATERIAL REF.: PVC SKIN, ELASTOMER FOAM.
2. TOLERANCE OF ± 3 MM APPLIED TO ALL DIMENSIONS.

REVISION RECORD			
REV	DESCRIPTION	DATE	BY
A	NHISA PART 572 NHRM RELEASE	1/30/04	DW
B	ADDED DIMENSION (174), ADDED "MATERIAL REF." TO MATERIAL NOTE #1, CHANGED TOLERANCE NOTE #2 FROM ± 2 TO ± 3	12/12/05	DW

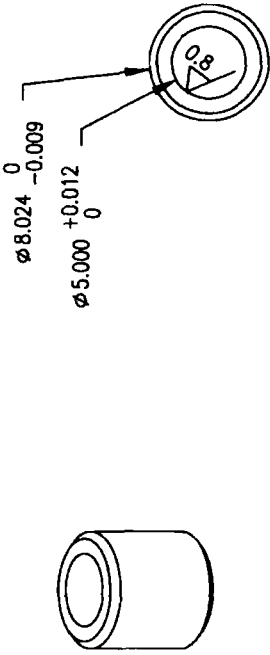
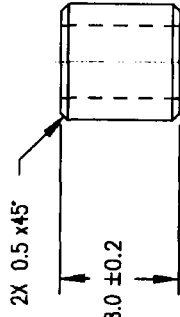
RELEASED
FEB 28, 2008
NHSTA

REV	QTY	PART NO.	DESCRIPTION
A	1		THIGH MOLDED, LEFT

UNITS ARE millimeters	
SEE NOTES	
TOLERANCES ARE:	0.500
DECIMALS:	0.5
FRACTIONS:	1/16
ANGLES:	30.0
WELDED:	1/16
WELDED:	1/16

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
THIGH MOLDED, LEFT	
A2	1 OF 1
175-7090-1	

4	3	2	1
D	C	B	A

RELEASED
FEB. 29, 2008
NHTSA

NOTES:

1. REMOVE ALL BURRS AND BREAK ALL SHARP EDGES.



REVISION RECORD

REV.	DESCRIPTION	DATE	BY
A	NHTSA PART 512 NHTSA RELEASE	11/30/04	DW
B	ADDED REF. TO MATERIAL SPECIFICATION AND GEN #1 NOTE #2	12/14/05	DW

UNITS ARE millimeters

TOLERANCES ARE:

DECIMALS	ANGLES	APPROX.	DATE
X ±0.5	±0.5		
X ±0.1			
XX ±0.05			

APPROVED:  **DATE:** 


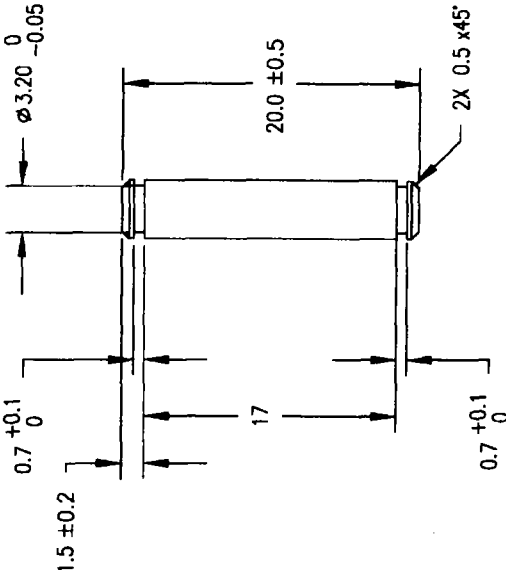
REVISIONS:

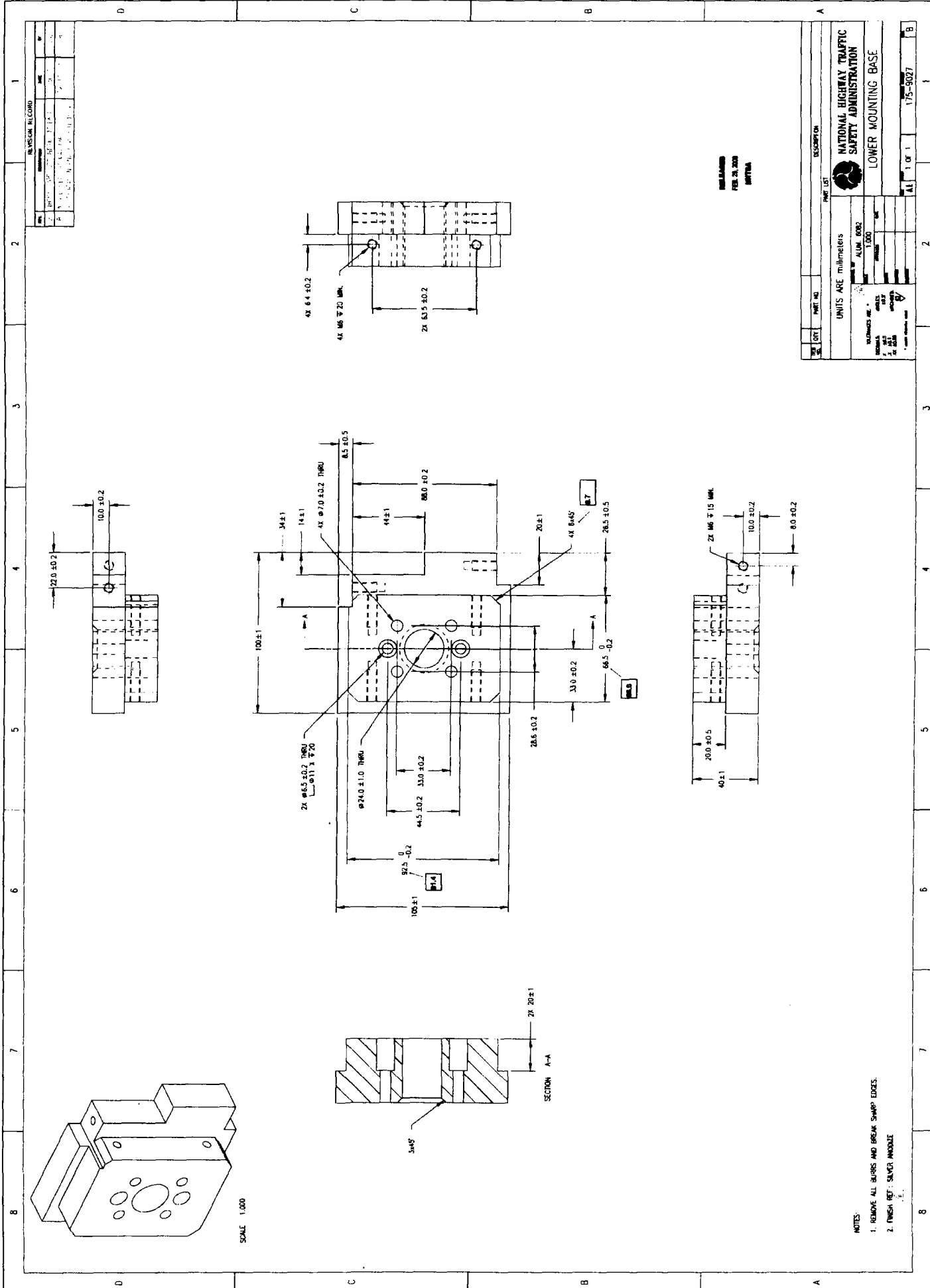
REV.	DESCRIPTION	DATE
A3	1 OF 1	175-9013

DESCRIPTION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

BEARING

4	3	2	1												
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>$\phi 4.000 \begin{smallmatrix} 0 \\ -0.008 \end{smallmatrix}$</p> </div> <div style="text-align: center;">  </div> </div>															
<p>RELEASED FEB. 29, 2008 NHTRSA</p>															
<p>REVISION RECORD</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>REV.</th> <th>DESCRIPTION</th> <th>DATE</th> <th>BY</th> </tr> <tr> <td>A</td> <td>NHTRSA PART 012 NEW RELEASE</td> <td>1/30/04</td> <td>DW</td> </tr> <tr> <td>B</td> <td>ADDED REF. TO MATERIAL SPECIFICATION</td> <td>12/14/05</td> <td>DW</td> </tr> </table>				REV.	DESCRIPTION	DATE	BY	A	NHTRSA PART 012 NEW RELEASE	1/30/04	DW	B	ADDED REF. TO MATERIAL SPECIFICATION	12/14/05	DW
REV.	DESCRIPTION	DATE	BY												
A	NHTRSA PART 012 NEW RELEASE	1/30/04	DW												
B	ADDED REF. TO MATERIAL SPECIFICATION	12/14/05	DW												
<p>NOTES:</p> <p>1. REMOVE ALL BURRS AND BREAK ALL SHARP EDGES.</p>															
<p>UNIT INFORMATION</p> <p>UNITS ARE millimeters</p> <p>MATERIAL REF. SS 304</p> <p>SCALE 3.000</p> <p>TOLERANCES ARE: * DECIMALS: X ±0.5 ANGLES: ±0.5 X ±0.1 MACHINED: XX ±0.05</p> <p>* unless otherwise noted</p>															
<p>PART LIST</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>ITEM NO.</th> <th>QTY</th> <th>PART NO.</th> <th>DESCRIPTION</th> </tr> <tr> <td colspan="4" style="text-align: center;"> <p>NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION</p> <p>PIN, MACHINED</p> </td> </tr> <tr> <td colspan="3"></td> <td style="text-align: right;"> <p>REV. 1 OF 1</p> <p>DATE 175-9014</p> <p>BY B</p> </td> </tr> </table>				ITEM NO.	QTY	PART NO.	DESCRIPTION	<p>NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION</p> <p>PIN, MACHINED</p>							<p>REV. 1 OF 1</p> <p>DATE 175-9014</p> <p>BY B</p>
ITEM NO.	QTY	PART NO.	DESCRIPTION												
<p>NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION</p> <p>PIN, MACHINED</p>															
			<p>REV. 1 OF 1</p> <p>DATE 175-9014</p> <p>BY B</p>												



NOTES:
 1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
 2. FINISH REF: SILVER ANODIZE.

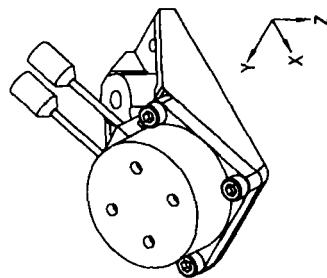
REVISION RECORD		PART NO.		DESCRIPTION	
REV	DATE	REV	DATE	REV	DATE
1	10/1/00	1	10/1/00	1	10/1/00
2	10/1/00	2	10/1/00	2	10/1/00
3	10/1/00	3	10/1/00	3	10/1/00
4	10/1/00	4	10/1/00	4	10/1/00
5	10/1/00	5	10/1/00	5	10/1/00
6	10/1/00	6	10/1/00	6	10/1/00
7	10/1/00	7	10/1/00	7	10/1/00
8	10/1/00	8	10/1/00	8	10/1/00
9	10/1/00	9	10/1/00	9	10/1/00
10	10/1/00	10	10/1/00	10	10/1/00
11	10/1/00	11	10/1/00	11	10/1/00
12	10/1/00	12	10/1/00	12	10/1/00
13	10/1/00	13	10/1/00	13	10/1/00
14	10/1/00	14	10/1/00	14	10/1/00
15	10/1/00	15	10/1/00	15	10/1/00
16	10/1/00	16	10/1/00	16	10/1/00
17	10/1/00	17	10/1/00	17	10/1/00
18	10/1/00	18	10/1/00	18	10/1/00
19	10/1/00	19	10/1/00	19	10/1/00
20	10/1/00	20	10/1/00	20	10/1/00
21	10/1/00	21	10/1/00	21	10/1/00
22	10/1/00	22	10/1/00	22	10/1/00
23	10/1/00	23	10/1/00	23	10/1/00
24	10/1/00	24	10/1/00	24	10/1/00
25	10/1/00	25	10/1/00	25	10/1/00
26	10/1/00	26	10/1/00	26	10/1/00
27	10/1/00	27	10/1/00	27	10/1/00
28	10/1/00	28	10/1/00	28	10/1/00
29	10/1/00	29	10/1/00	29	10/1/00
30	10/1/00	30	10/1/00	30	10/1/00
31	10/1/00	31	10/1/00	31	10/1/00
32	10/1/00	32	10/1/00	32	10/1/00
33	10/1/00	33	10/1/00	33	10/1/00
34	10/1/00	34	10/1/00	34	10/1/00
35	10/1/00	35	10/1/00	35	10/1/00
36	10/1/00	36	10/1/00	36	10/1/00
37	10/1/00	37	10/1/00	37	10/1/00
38	10/1/00	38	10/1/00	38	10/1/00
39	10/1/00	39	10/1/00	39	10/1/00
40	10/1/00	40	10/1/00	40	10/1/00
41	10/1/00	41	10/1/00	41	10/1/00
42	10/1/00	42	10/1/00	42	10/1/00
43	10/1/00	43	10/1/00	43	10/1/00
44	10/1/00	44	10/1/00	44	10/1/00
45	10/1/00	45	10/1/00	45	10/1/00
46	10/1/00	46	10/1/00	46	10/1/00
47	10/1/00	47	10/1/00	47	10/1/00
48	10/1/00	48	10/1/00	48	10/1/00
49	10/1/00	49	10/1/00	49	10/1/00
50	10/1/00	50	10/1/00	50	10/1/00
51	10/1/00	51	10/1/00	51	10/1/00
52	10/1/00	52	10/1/00	52	10/1/00
53	10/1/00	53	10/1/00	53	10/1/00
54	10/1/00	54	10/1/00	54	10/1/00
55	10/1/00	55	10/1/00	55	10/1/00
56	10/1/00	56	10/1/00	56	10/1/00
57	10/1/00	57	10/1/00	57	10/1/00
58	10/1/00	58	10/1/00	58	10/1/00
59	10/1/00	59	10/1/00	59	10/1/00
60	10/1/00	60	10/1/00	60	10/1/00
61	10/1/00	61	10/1/00	61	10/1/00
62	10/1/00	62	10/1/00	62	10/1/00
63	10/1/00	63	10/1/00	63	10/1/00
64	10/1/00	64	10/1/00	64	10/1/00
65	10/1/00	65	10/1/00	65	10/1/00
66	10/1/00	66	10/1/00	66	10/1/00
67	10/1/00	67	10/1/00	67	10/1/00
68	10/1/00	68	10/1/00	68	10/1/00
69	10/1/00	69	10/1/00	69	10/1/00
70	10/1/00	70	10/1/00	70	10/1/00
71	10/1/00	71	10/1/00	71	10/1/00
72	10/1/00	72	10/1/00	72	10/1/00
73	10/1/00	73	10/1/00	73	10/1/00
74	10/1/00	74	10/1/00	74	10/1/00
75	10/1/00	75	10/1/00	75	10/1/00
76	10/1/00	76	10/1/00	76	10/1/00
77	10/1/00	77	10/1/00	77	10/1/00
78	10/1/00	78	10/1/00	78	10/1/00
79	10/1/00	79	10/1/00	79	10/1/00
80	10/1/00	80	10/1/00	80	10/1/00
81	10/1/00	81	10/1/00	81	10/1/00
82	10/1/00	82	10/1/00	82	10/1/00
83	10/1/00	83	10/1/00	83	10/1/00
84	10/1/00	84	10/1/00	84	10/1/00
85	10/1/00	85	10/1/00	85	10/1/00
86	10/1/00	86	10/1/00	86	10/1/00
87	10/1/00	87	10/1/00	87	10/1/00
88	10/1/00	88	10/1/00	88	10/1/00
89	10/1/00	89	10/1/00	89	10/1/00
90	10/1/00	90	10/1/00	90	10/1/00
91	10/1/00	91	10/1/00	91	10/1/00
92	10/1/00	92	10/1/00	92	10/1/00
93	10/1/00	93	10/1/00	93	10/1/00
94	10/1/00	94	10/1/00	94	10/1/00
95	10/1/00	95	10/1/00	95	10/1/00
96	10/1/00	96	10/1/00	96	10/1/00
97	10/1/00	97	10/1/00	97	10/1/00
98	10/1/00	98	10/1/00	98	10/1/00
99	10/1/00	99	10/1/00	99	10/1/00
100	10/1/00	100	10/1/00	100	10/1/00

NATIONAL HIGHWAY TRAFFIC
 SAFETY ADMINISTRATION
 LOWER MOUNTING BASE

REV. 10/1/00
 FEB. 20, 2000
 MTHA

REVISION RECORD

REV	DESCRIPTION	DATE	BY
A	NHTSA PART 572 NPRM RELEASE	7/30/04	DW
B	ADDED DIMENSIONS FOR MOUNTING BRACKET AND INFORMATION/NOTES FOR LOAD CELL, REMOVED DRAWINGS SA572-S71-2 AND SA572-S71-3, POLARITY SYMBOLS WERE REMOVED FROM FRONT AND TOP VIEWS	9/10/07	DW



SPECIFICATIONS

AXIS	CAPACITY	KN
F _x	2,698	12
F _y	2,698	12
F _z	3,147	14
M _x	3,983	450
M _y	3,983	450
M _z	2,655	300

OUTPUT AT CAPACITY: 0.75 mV/V MIN.

NONLINEARITY < 1% FULL SCALE

CROSSTALK ≤ 5% FULL SCALE

WEIGHT: (0.8 lb./0.36 kg./MAX.)

0.93 lb./0.42 kg MAX.

SIGNAL OUTPUT MUST BE COMPATIBLE WITH AND RECORDABLE IN A DATA CHANNEL AS DEFINED BY SAE J211

FREE AIR RESONANT FREQUENCY

FORCES 5000 Hz MIN.

MOMENTS 3000 Hz MIN.

OPERATING TEMPERATURE

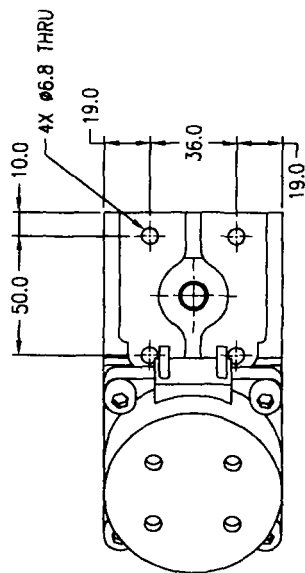
0° TO 200°F

THERMAL SENSITIVITY

(60° TO 80°F) ≤ .03% OF READING /°F

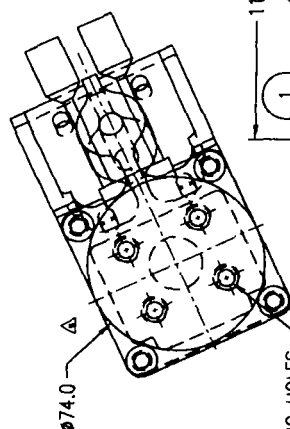
MATERIAL:

THE LOAD BEARING STRUCTURE OF THE LOAD CELL, INCLUDING PROVISIONS FOR THE LOAD CELL MOUNTING, ARE OF METAL OR METAL ALLOYS, NON-LOAD BEARING PARTS OF THE LOAD CELL, INTERNALLY AND/OR EXTERNALLY, INCLUDING WIRES AND THEIR ATTACHMENTS, MAY BE MADE OF ANY MATERIAL PROVIDED THEY DO NOT INTERFERE WITH THE PERFORMANCE OF THE LOAD CELL OR THE TRANSMISSION OF THE LOAD CELL SIGNALS.



VIEW A-A

LOAD CELL AND BRACKET MAINTAIN NECK IN THE STANDARD LOCATION



4X MOUNTING HOLES FOR M6 x 1.0 x 20mm LG. SHCS PART #5000281



NEUTRAL AXIS

BASE BRACKET DUPLICATES THE MOUNTING GEOMETRY OF STRUCTURAL REPLACEMENT (175-2500)

RELEASED
FEB. 28, 2008
NHTSA

ITEM NO.	QTY.	PART NO.	DESCRIPTION	MATERIAL
3	1	5000075	SCREW, SHCS M8 x 1.25 x 20mm LG.	
2	1	SA572-S71-3	LOWER NECK LOAD CELL-MOUNTING BRACKET (NO DRAWING)	
1	1	SA572-S71-2	LOWER NECK LOAD CELL (NO DRAWING)	

UNITS ARE mm	
DECIMALS	ANGLES
.X ±2.5	+ 0.5°
.XX ±0.25	MACHINED
.XXX ±0.127	63/100
* unless otherwise noted	
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	
LOWER NECK LOAD CELL ASSEMBLY	
ES-2re	
REV	DATE
B	SA572-S71-1
B	REV



First Technology

Innovative Solutions

First Technology Safety Systems Inc.

47460 Galleon Drive

Plymouth MI 48170, USA

Phone: (734) 451-7878 • Fax: (734) 451-9549

SHIPPER/PACKING LIST

SHIPPER NUMBER

SHIPPED TO: Altoona Highway Traffic Safety Administration
ADDRESS: 1200 New Jersey Avenue, SE
CITY: Washington DC 20590
ATTENTION: Administrative

CUSTOMER'S ORDER NUMBER:	OUR NUMBER:	SHIPPED VIA:	DATED SHIPPED:
--------------------------	-------------	--------------	----------------

SHIPPED	PART #	DESCRIPTION
1		ES2re Petition letter
2		
3		
4		Joe Bastian
5		
6		
7		
8		

HOW PACKED:	RECEIVED BY:
-------------	--------------